UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,720	09/05/2007	Gunter Fischer	536-009.025	4983

4955 7590 10/01/2010

WARE FRESSOLA VAN DER SLUYS & ADOLPHSON, LLP
BRADFORD GREEN, BUILDING 5
755 MAIN STREET, P O BOX 224
MONROE, CT 06468

EXAMINER	
WONG, LINDA	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
10/01/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/574,720	FISCHER, GUNTER	
	Examiner	Art Unit	
	LINDA WONG	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26,30* is/are rejected.

7)☒ Claim(s) *27-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,5-11,17,20,22, are rejected 35 U.S.C. 103(a) as being unpatentable over Richards et al (US Patent No.: 6950485) in view of Roberts (US Publication No.: 20060166619)

Claim 1, Richards et al discloses

"a first encoding step, in which a pulse group which is formed from a predetermined number of individual pulses in such a way that the individual pulses" are situated in a particular manner "in respect of time after the pulse forming operation is encoded in dependence on values of a random number sequence" (Fig. 1b, label code generator produces codes with timing offset commands. The codes are passed to the pulse timing generator for pulse position modulation. (Fig. 1a, label precision timing generator and Fig. 1b same label.) Col. 7, lines 40-45 discloses the code generator supplies pseudo-random

time offsets. Fig. 21c shows the areas where overlapping occurs and non-overlap in time.)

"a correlation step on the part of the receiver in which correlation of a reception signal with a signal pattern is effected" (Fig. 1b, label 136 for correlating the reception signal (label 128) and the template generated from the code genitor and precision timing generator (labels 120,112,132).)

"wherein the signal pattern corresponds to the whole pulse group to be expected when using the same values of the random number sequence" (Col. 7, lines 15-20 discloses the template generator generates a signal with a shape that matches the shape of the received signal. Fig. 1a shows the transmitter is coded with the sequence or timing offset generated from the code generator to produce a transmit signal. Since the template generator generates a signal with the same shape of the received signal and the received or transmit signal is modulated with a code sequence as produced by the code generator, then the template generator would generate a signal with the shape of the random sequence and data signal. Col. 7, lines 40-45 discloses the code generator supplies pseudo-random time offsets or different codes. Fig. 3 shows the transceiver.)

Richards et al fails to disclose the pulses are situated in a manner such that the pulses in said pulse group partially overlap. Roberts discloses pulse position modulation, where a group of pulses (paragraph 29 discloses individual pulses of a pulse stream are encoded.) partially overlap (paragraph 34 discloses two pulses overlap). It would be obvious to one skilled in the art at the time of the

invention to modify the pulse position modulation scheme of Richards with an overlapping pulse position modulation as disclosed by Roberts so to provide a simple modulation scheme that will achieve reasonable power efficiency for a large throughput.

Claim 5, Richards et al discloses "the first encoding step the individual pulses are phase-modulated in dependence on the respectively current value of the random number sequence." (Col. 7, lines 40-67 discloses the code generator produces PN codes, wherein the codes are used by the precision timing to form pulses. (Fig. 3, label 102,120) The phase of the pulses would depend on the PN codes so to implement pulse position modulation.)

Claim 6, Richards et al discloses "the transmitter additionally effects modulation of the spacing in respect of time of mutually successive pulse groups (first spacing modulation)." (Col. 6, lines 47-65 discloses pulse position modulation, wherein the timing or spacing of the pulses is affected by the code generator. (Col. 7))

Claim 7, Richards et al discloses "the first spacing modulation operation is effected in such a way that the spectral energy distribution of signals emanating from the transmitter does not exceed predetermined limit values." (Col. 6, lines 40-67 discloses the signal to noise ratio, whererin the signal to noise ratio measures the spectral energy distribution of signals in the transmitter, depends on the number of pulses and the timing must be stable and accurate over the entire integration time. The signal to noise ratio must be maintained by

generating greater precision.) Although Richards et al fails to disclose a threshold for comparing the signal to noise ratio, it would have been obvious to one skilled in the art to use a threshold to determine whether the SNR is good and thus maintaining the SNR.

Claim 8, Richards et al discloses “the first spacing modulation operation is effected in dependence on the random number sequence." (Col. 6, lines 47-65 discloses pulse position modulation, wherein the timing or spacing of the pulses is affected by the code generator. (Col. 7) The code generator outputs a timing offset according to the code set driving the transmitter.)

Claim 9, Richards et al discloses “the transmitter and the receiver select the same random sequence from a number of random number sequences and the first encoding step is used at the same time for channel encoding.” (Fig.3, label 102 is passed to the precision timing, wherein the output is passed to 132 of the receiver.)

Claim 10, Richards et al discloses “the transmitter effects modulation of the spacing in respect of time of the individual pulses of the pulse group from each other in dependence on values of the random number sequence (second spacing modulation).” (Col. 6, lines 47-65 discloses pulse position modulation, wherein the timing or spacing of the pulses is affected by the code generator. Col. 7, lines 40-45 discloses the code generator supplies pseudo-random time offsets.)

Claim 11, Richards et al discloses “the transmitter and the receiver effect synchronization of the random number sequence prior to the commencement of

information transmission." (Fig. 3, label code generator output is sent to the precision timing generator, wherein the timing generator and code generator controls the template generator used for correlation. Since the code generator and precision timing generator affects the pulses and its timing, synchronization of the transmitter and receiver (as shown in Fig.3) would be affected. Col. 7, lines 40-45 discloses the code generator outputs random codes.)

Claim 14, Richards et al discloses "two bit values in a pulse group are transmitted, wherein a first bit value is encoded in a first predetermined number of individual pulses and a second bit value is encoded in the remaining number of individual pulses." (Col. 1, line 65-Col. 2, line 10 discloses each data bit time position usually modulates many of the transmitted pulses. This yields a modulated, coded timing signal that comprises a train of identically shaped pulses for each single data bit. In pulse position modulation, each pulse transmitted is varied slightly from the predetermined pulse to pulse interval time. This indicates each bit is modulated with a pulse group and each group varies slightly in time.)

Claim 17, Richards et al discloses

"a pulse generator which is adapted to deliver individual pulses at a predeterminable time spacing from each other" (Fig. 3, label pulser for generating a code according to the timing set by the precision timing generator.)

"a code generator which is adapted to deliver random signals dependent on the values of a random number sequence" (Fig. 3, label 102 and Col. 7, lines

40-45 discloses the code generator outputs PN sequence, wherein the sequence will dictate inverting or non-inverting the pulses.)

"an encoding unit which is adapted to encode an individual pulse delivered or to be delivered by the pulse generator in dependence on the current random signal" (Fig. 1a, label precision timing generator and Fig. 1b same label.) Col. 7, lines 40-45 discloses the code generator supplies pseudo-random time offsets.)

"a control unit which is connected to the pulse generator and which is adapted to actuate the pulse generator at predeterminable moments in time for the delivery of a pulse group with a predetermined number of encoded individual pulses at predetermined time spacing from each other." (Fig. 3, label 108 sets the timing of the timing generator so the timing generator can deliver pulse group with the timing spacing set by the timing generator and the code generator.)

"wherein the control unit is additionally adapted to control the pulse generator" (Fig. 3, label 108 sets the timing of the timing generator)

the control unit controls "the encoding unit to form the coded pulse group from a predetermined plurality of single pulses in dependence on the values of the random number sequence" (Fig. 3, label 102 code generator is controlled by the timing generator, wherein the timing generator is controlled by the control unit, 108. Col. 7, lines 8-30 discloses the code generator supplies time offset commands identical to the code set driving the transmitter. The precision timing generator produces pulses according to the time offset commands or random number sequence.)

Richards et al fails to disclose the encoding is performed "in such a way that the single pulses of said pulse group overlap in time after the pulse formation". Roberts discloses pulse position modulation, where a group of pulses (paragraph 29 discloses individual pulses of a pulse stream are encoded.) partially overlap (paragraph 34 discloses two pulses overlap). It would be obvious to one skilled in the art at the time of the invention to modify the pulse position modulation scheme of Richards with an overlapping pulse position modulation as disclosed by Roberts so to provide a simple modulation scheme that will achieve reasonable power efficiency for a large throughput.

Claim 18, Richards et al discloses "the control unit is adapted to actuate the pulse generator to effect modulation of the spacing in respect of time of successive pulse groups" (Fig. 3, label 108 controls the timing generator which controls the pulser, wherein the precision timing generator modulates the input data (Fig. 1b) with a timing offset set by the code generator. Col. 1, line 65-Col. 2, line 10 discloses pulse position modulation and pulse groups.)

Claim 19, Richards et al discloses "the control unit controls the first spacing modulation in such a way that the spectral energy distribution of signals emanating from the transmitter does not exceed predetermined limit values." (Fig. 3, label time base controls the timing generator so to ensure long term stable operation. The time based helps create pulses of short duration and controlled pulse-to-pulse intervals, which indicates the spectral energy of distribution of the transmission signal would be affected.) It would have been

obvious to one skilled in the art at the time of the invention to use a threshold to ensure long term stable operation based on design choice.

Claim 20, Richards et al discloses "the first spacing modulation is effected in dependence on the random number sequence." (Fig. 3, label code generator generates a random number sequence. (Col. 7) and the precision timing generator performs modulation or generates timing pulses according or depending on the random sequence.)

Claim 22, Richards et al discloses "the control unit is adapted to actuate the pulse generator for modulation of the time spacing of the individual pulses of the signal pulse group from each other in dependence on values of the random number sequence." (Col. 6, lines 47-65 discloses pulse position modulation, wherein the timing or spacing of the pulses is affected by the code generator. (Col. 7) Col. 7 discloses the code generator produces a random number sequence.)

Claims 2,13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al in view of Roberts as applied to claim 1, in view of Chan (US Patent No.: 6925130)

Claim 2, Richards et al discloses an encoder (Fig. 3, labels 102, and 120 for performing encoding) but fails to disclose the recited limitation.

Chan discloses "a second encoding step prior to, during or after the first encoding step, in which at least one bit value to be transmitted as information in

the pulse group is encoded in accordance with a predetermined encoding rule." (Fig. 3, label 306 shows the composition of the encoder, wherein a first and second encoder is found within the encoder receiving the timing and mode control logic and encoding the transmit data with the information. The control logic determines the encoding type or rule. Fig. 3 shows a wave generator, wherein a wave will include a plurality of pulses.) It would have been obvious to one skilled in the art to have two encoders as disclosed by Chan in the encoder disclosed by Richards et al so to reduce transmission emission.

Claim 13, Chan discloses "the predetermined encoding rule for encoding of a bit value provides for inverting or non-inverting, depending on the respective bit value, all individual pulses of a pulse group on the respective bit value." (Fig. 3, label 306 shows the composition of the encoder, wherein when encoding the input data, the sign of the input data value would cause the correlation to be inverting or non-inverting. Fig. 3 shows a wave generator, wherein a wave will include a plurality of pulses.)

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al in view of Roberts as applied to claim 1, in view of Roberts (US Patent No.: 20060166619)

Claim 12,

Richards et al fails to disclose the recited limitation.

Roberts discloses "the transmitter transmits to the receiver a training sequence of pulse groups, that is know to the receiver." (paragraph 275 discloses transmitting a preamble with known sequence.) It would have been obvious to one skilled in the art to incorporate transmission of a preamble as disclosed by Roberts in Richards et al so to provide the receiver with information needed for efficient decoding of the transmitted signal.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al in view of Roberts as applied to claim 1.

Claim 15, Richards et al discloses "wherein to ascertain the transmitted bit values on the part of the receiver in the correlation step, correlation of the reception signal with four signal patterns to be expected is effected." (Fig. 3, label template generator outputs a template according to the code generated and timing generator. The template is correlated, label 136, with the received signal.) Although Richards fails to disclose four signal patterns in the template, the pattern of the template would depend on the code generator and can have four signal patterns based on design choice.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al in view of Roberts as applied to claim 1, in view of Yamaguchi (US Publication No.:20040179580).

Claim 16, Yamaguchi discloses "wherein a current value of a parameter which dependent on the instantaneous transmission conditions is ascertained and the number of individual pulses of the pulse group is determined in dependence on the current value." (paragraph 70 discloses generating a code based on the channel impulse response, wherein channel impulse response is a value or an indication dependent on the transmission conditions.) It would have been obvious to one skilled in the art at the time of the invention to incorporate using the channel impulse response to generate a code word as disclosed by Yamaguchi in Richards et al so to reduce noise.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al in view of Roberts as applied to claim 1, in view of Richards et al (US Publication No.: 20030194979).

Claim 21, Richards et al discloses producing a random sequence from the code generator. (Fig. 3, label code generator and Col. 7, lines 40-45.) Richards et al fails to disclose all the recited limitations.

Richards et al discloses a selectable code generated by the code generator, but fails to disclose the controller performs such functionality. It would have been obvious to one skilled in the art at the time of the invention to incorporate such a command at the controller based on design choice.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 23,25 are rejected under 35 U.S.C. 102(b) as being anticipated by Richards et al (US Patent No.: 6950485).

Claim 23, Richards et al discloses

"a pulse generator which is adapted to deliver individual pulses at a predeterminable time spacing from each other" (Fig. 3, label pulser for generating a code according to the timing set by the precision timing generator.)

"a code generator which is adapted to deliver random signals dependent on the values of a random number sequence" (Fig. 3, label 102 and Col. 7, lines 40-45 discloses the code generator outputs PN sequence, wherein the sequence will dictate inverting or non-inverting the pulses.)

"an first encoding unit which is adapted to encode an individual pulse delivered or to be delivered by the pulse generator in dependence on the current random signal" (Fig. 1a, label precision timing generator and Fig. 1b same label.) Col. 7, lines 40-45 discloses the code generator supplies pseudo-random time offsets.)

"a control unit which is connected to the pulse generator and which is adapted to actuate the pulse generator at predeterminable moments in time for the delivery of a pulse group with a predetermined number of encoded individual

pulses at predetermined time spacing from each other." (Fig. 3, label 108 sets the timing of the timing generator so the timing generator can deliver pulse group with the timing spacing set by the timing generator and the code generator.)

"the ultra wideband receiving apparatus further having a correlation unit which is connected to the pulse group generator" (Fig. 1b, label 136 as the correlator, labels 132,120,132,108 as the pulse group generator)

The correlation unit is "adapted to deliver an output signal dependent on the correlation of a reception signal with the signal pattern". (Fig. 1b, label 136 for correlating the reception signal (label 128) and the template generated from the code genitor and precision timing generator (labels 120,112,132).)

Claim 25, Richards et al discloses "the pulse group generator has a filter device which is adapted to modify the pulse group in accordance with a predetermined filter characteristic." (Fig. 5, label 508 contains a filter, wherein the filter characteristic affects the timing generated by the precision timing generator.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al as applied to claim 23.

Claim 24, Richards et al discloses a template generator for generating a correlation template for correlating with the received signal, label 136 of Fig. 3 or 1b. Although Richards et al fails to disclose a temporary memory block in the correlation unit, it would be obvious to one skilled in the art to inherently include such a block based on design choice and necessity since the timing between the arrival of the received signal and generation of the template correlation signal must be matched prior to performing correlation.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al as applied to claim 23, in view of Chan (US Patent No.: 6925130)

Claim 26, Richards et al discloses an encoder (Fig. 3, labels 102, and 120 for performing encoding) but fails to disclose the recited limitation.

Chan discloses "the pulse group generator has a second encoding unit which is adapted to encode at least one bit value in the pulse group in accordance with a predetermined encoding rule." (Fig. 3, label 306 shows the composition of the encoder, wherein a first and second encoder is found within the encoder receiving the timing and mode control logic and encoding the transmit data with the information. The control logic determines the encoding type or rule.) It would have been obvious to one skilled in the art to have two

encoders as disclosed by Chan in the encoder disclosed by Richards et al so to reduce transmission emission.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al as in view of Roberts (US Publication No.: 20060166619)

Claim 30, Richards et al discloses

"wherein the control unit is additionally adapted to control the pulse generator" (Fig. 3, label 108 sets the timing of the timing generator)

the control unit controls "the first encoding unit to form the coded pulse group from a predetermined plurality of single pulses in dependence on the values of the random number sequence" (Fig. 3, label 102 code generator is controlled by the timing generator, wherein the timing generator is controlled by the control unit, 108. Col. 7, lines 8-30 discloses the code generator supplies time offset commands identical to the code set driving the transmitter. The precision timing generator produces pulses according to the time offset commands or random number sequence.)

Richards et al fails to disclose the encoding is performed "in such a way that the single pulses of said pulse group overlap in time after the pulse formation". Roberts discloses pulse position modulation, where a group of pulses (paragraph 29 discloses individual pulses of a pulse stream are encoded.) partially overlap (paragraph 34 discloses two pulses overlap). It would be obvious to one skilled in the art at the time of the invention to modify the pulse position

modulation scheme of Richards with an overlapping pulse position modulation as disclosed by Roberts so to provide a simple modulation scheme that will achieve reasonable power efficiency for a large throughput.

Allowable Subject Matter

Claims 3,4,27,28,29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LINDA WONG whose telephone number is (571)272-6044. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Linda Wong/
Examiner, Art Unit 2611

/David C. Payne/
Supervisory Patent Examiner, Art Unit 2611